

REMARKS

This Response is offered in reply to Office Action mailed September 16, 2002. A petition and fee for a two (2) month time extension are enclosed.

In paragraph 1 of the action, claims 1-17 are rejected under 35 USC 112, second paragraph as indefinite. Applicants have amended the claims in a manner believed to overcome the Section 112 rejection. Reconsideration is requested.

In paragraph 2 of the action, claims 1-4, 6-9, 11-14, and 16 are rejected under 35 USC 102(b) in view of the Yamada US Patent 4 780 062.

Claims 8 and 16 are cancelled without prejudice.

Applicants believe pending claims 1-4, 6-9, 11-14, and 16 distinguish over the Yamada patent. The Yamada patent discloses a self-exciting piezoelectric fan wherein feedback output from a feedback electrode 36 on a first piezoelectric element is fed via a feedback loop having a wave-shaping circuit and amplifier circuit to respective exciting electrodes disposed on first and second piezoelectric elements to maintain excitation frequency in a manner to operate the fan at resonance frequency.

The Yamada patent does not disclose the features of Applicants' claims 1-4, 6-9, 11-14, and 16. In particular, Yamada does not disclose a device pursuant to claim 1 for moving a fluid wherein the device comprises a movable member having a first piezoelectric actuator element coupled thereto to drive the movable member to move the fluid and a second piezoelectric sensing element coupled thereto to provide feedback signals to a controller that determines from the feedback signals at least one of viscosity, density, and temperature of the fluid and controls the first piezoelectric actuator element in response to at least one of the determined viscosity, density, and temperature of the fluid.

Yamada does not disclose a second piezoelectric sensing element that provides feedback signals of the type set forth in claims 2, 3, and 4. Yamada's feedback electrode 36 provides the phase (sinusoidal wave) of the response of the fan to the wave-shaping circuit of the feedback loop.

Yamada does not disclose a power source controlled by a controller to provide a power output signal in response to at least one of the determined viscosity, density, and temperature of the fluid as set forth in claim 9. Yamada in contrast provides feedback output from feedback electrode 36 via the feedback loop having a wave-shaping circuit and amplifier circuit to respective exciting electrodes disposed on first and second piezoelectric elements to maintain excitation frequency in a manner to operate the fan at resonance frequency.

Yamada does not disclose a method of operating a piezoelectric device for moving a fluid pursuant to claim 11 comprising the steps of moving a movable member using a first piezoelectric actuator element on the movable member, and providing feedback signals from a second piezoelectric element on the movable member to a controller wherein the controller determines from the feedback signals at least one of viscosity, density, and temperature of the fluid and controls the first piezoelectric actuator element in response to at least one of the determined viscosity, density, and temperature of the fluid.

Yamada does not disclose the features of claims 12, 13, and 14. Yamada's feedback electrode 36 provides the phase (sinusoidal wave) of the response of the fan to the wave-shaping circuit of the feedback loop.

Reconsideration of the rejection of claims 1-4, 6-9, 11-14, and 16 is requested.

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In paragraph 4 of the action, claims 5 and 15 are rejected under 35 USC 103(a) as obvious in view of the Yamada US Patent 4 780 062.

With respect to claims 5 and 15, the examiner notes that Yamada does not disclose a second piezoelectric sensing element having a thermal expansion coefficient different from that of a first piezoelectric actuator element. The examiner is correct. Applicants provide such claimed features to provide feedback signals related to fluid temperature to the controller in a manner not remotely disclosed or suggested in Yamada. As mentioned above, Yamada's feedback electrode 36 provides the phase (sinusoidal wave) of the response of the fan to the wave-shaping circuit of the feedback loop.

Reconsideration of the rejection of claims 5 and 15 is requested.

Applicants note that claims 10 and 17 are not rejected in the office action on the basis of Yamada or any other art. Yamada is utterly silent with respect to the features set forth in claims 10 and 17.

Applicants have added new claims 18, 19, and 20, which are believed to be allowable also. The Commissioner is authorized to charge any fee for these new claims to my deposit account No. 20-1124, although no additional fee is believed to be due.

Allowance of the pending claims is requested.

Respectfully submitted,



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CERTIFICATE OF MAILING

I hereby certify that this correspondence and enclosures are being deposited with the United States Postal Service under 37 CFR 1.8 as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on February 14, 2003.

Edward J. Timmer